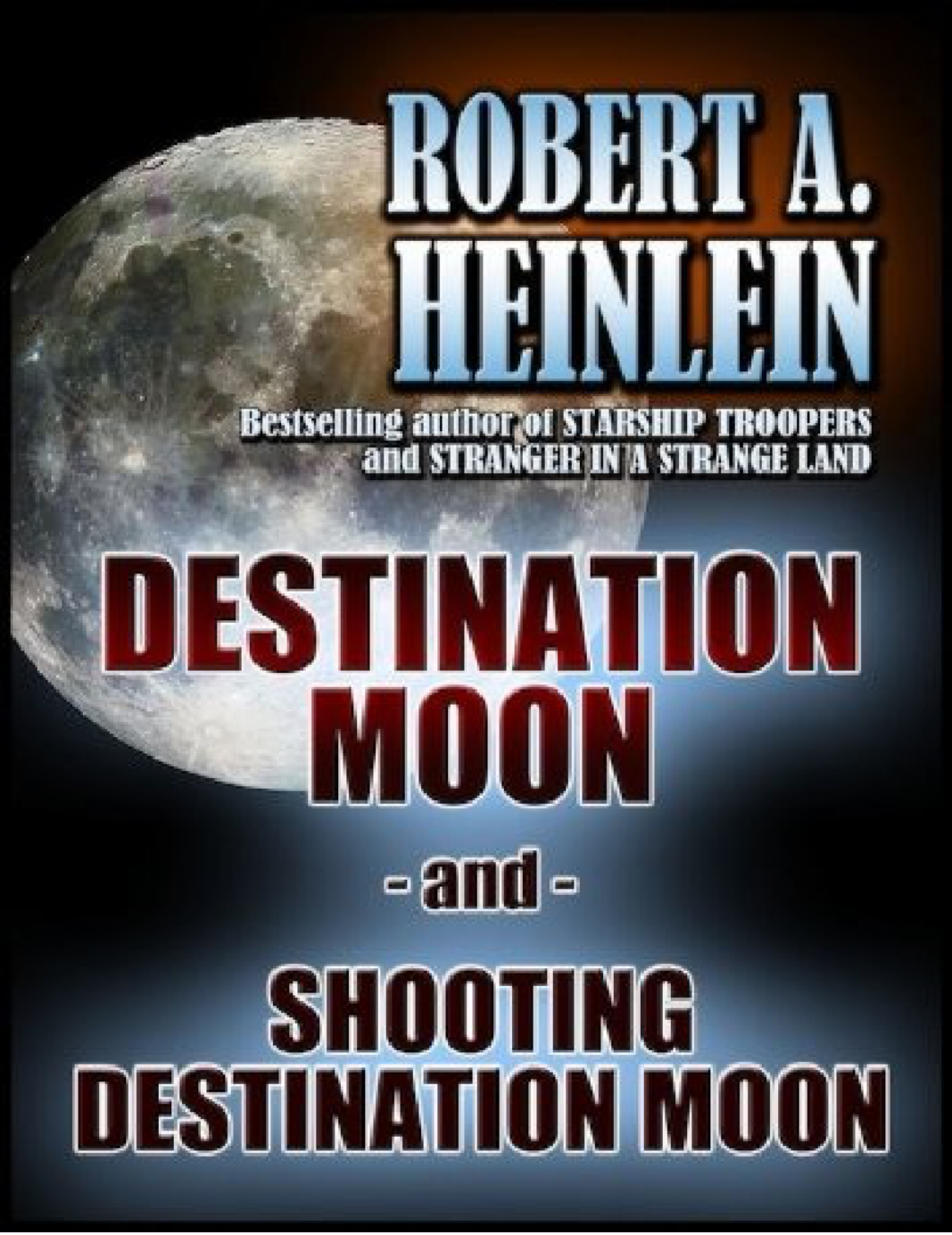
ROBERT A.
HEINLEIN
Bestselling author of STARSHIP TROOPERS
and STRANGER IN A STRANGE LAND
DESTINATION
MOON
- and -
SHOOTING
DESTINATION MOON

Robert A Heinlein - DESTINATION MOON Today, with space full of ships, colonies on the inner planets, and Earth's Moon so close that pilots on the Luna run sleep home nights, it is hard to imagine when 'flying to the Moon" was a figure of speech for the impossible, when men who thought it could be done were visionaries, crackpots. It is hard to realize the opposition they faced, to understand why they persisted, what they thought. — Farquharson, History of Transportation, III: 414 I The Mojave Desert was gray with first morning light, but at the construction site lights were still burning in the office of the technical director. The office was quiet, save for petulant burbling of a pot of coffee. Three men were present—the director himself, Doc tor Robert Corley, Lincoln-tall and lean, Rear Admiral "Red" Bowles, regular navy retired, and Jim Barnes, head of Barnes Aircraft, Barnes Tool Works, other enterpnses. All three needed shaves; Barnes badly needed a haircut as well. Barnes was seated at Corley's desk; Bowles sprawled on a couch, apparently asleep and looking like a fat, redheaded baby; Doctor Corley paced the room, following a well worn pattern. He stopped, and stared out the window. A thousand yards away on the floor of the desert a great ship, pointed and sleek, thrust up into the sky, ready to punch out through Earth's thick atmosphere. Wearily he turned away and picked up a letter from the desk; it read: Reaction Associates, Inc. Mojave, California. Gentlemen: Your request to test the engine of your atomic-powered rocket ship at the site of its construction is regretfully denied. Although it is conceded that no real danger of atomic explosion exists, a belief in such danger does exist in the public mind. It is the policy of the Commission—Corley skipped down to the last paragraph:— therefore, test is authorized at the Special Weapons Testing Center, South Pacific. Arrangements may be— He stopped and shoved the letter at Barnes. "If we've got to test at Eniwetok, we've got to find the money to do it." Barnes' voice showed exasperation. "Doc, I've told you the syndicate won't put up another dime; there is no other money to be found." "Confound it—we should have government money!" Barnes grunted. "Tell that to Congress." Without opening his eyes Bowles commented, "The United States is going to stall around and let Russia get to the Moon first—with hydrogen bombs~ That's what you call 'policy." Corley chewed his lip. "It's got to be now." "I know it." Barnes got up and went to the window. The rising sun caught a highlight on the polished skin of the great ship. "It's got to be now," he repeated soffly. He turned and said, "Doc, when is the next favorable time to leave?" "When we planned on it—next month." "No, I mean this month." Corley glanced at the wall calendar, dug into a bookcase for a well-thumbed volume, did a quick estimate.

“Tomorrow morning—around four o’clock.” “That’s it, then. We blast off tomorrow morning.” Admiral Bowles sat up with a jerk. “Blast off in an untested ship? Jim, you’re crazy!” “Probably. But now is the time—now. If we wait even a month, we will be tangled in some new snafu. That ship is ready, except for testing the power plant. So we’ll skip the test!” “But we haven’t even selected a crew.” Barnes grinned. “We’re the crew!” Neither Corley nor Bowles answered. Barnes went on, “Why not? The takeoff is automatic. Sure, we agreed that we should have young men, fast reflexes, and all that malarkey—and every damned one of us has been trying to figure out a reason why he should be included. You, Red, you sneaked off to Moffeatt Field and took a pilot’s physical. Flunked it, too. Don’t lie to me;~ I know. And you, Doc, you’ve been hinting that you ought to nurse the power plant yourself—you’ve been working on your wife, too.” “Eh?” “She wanted me to say that the syndicate would object to yOur going. Don’t worry; I didn’t agree.” Corley looked at him levelly. “I’ve always intended to go. She knows that.” “That’s my boy! Red?” Bowles heaved himself to his feet. “Shucks, Jim, I didn’t bust that physical much—just overweight.” “You’re in. I don’t want an eager young beaver as co-pilot anyhow.” “‘Co—pilot?’” “Want to rassle me for skipper? Red, I’ve meant to gun this crate myself ever since the day—Lordy, four years ago!—when you brought Doc to see me with a satôhelful of blueprints.” He drew a breath and looked around. exultantly. Bowles said, “Let’s see. You for pilot; I’m co-; Doc is chief. That leaves nobody but the radarman. You can’t possibly train a man in the electronics of that ship by tomorrow morning.” Barnes shrugged. “Hobson’s choice —it has to be Ward.” He named the chief electronics engineer of the project. Bowles turned to Corley. “Does Ward hanker to go?” Corley looked thoughtful. “I’m sure he does. We haven’t discussed it.” He reached for the phone. “I’ll call his quarters.” Barnes stuck a hand .j~ the way. “Not so fast. Once the word got out, the Commission has twenty-four hours in which to stop us.” Bowles glanced at his watch. “Twenty-one hours.” “Long enough, anyhow.” Corley frowned. “We can’t keep it secret. We’ve got to load that ship. I’ve got to reach Dr. Hastings and get our ballistic calculated.” ~“One thing at a time.” Barnes paused, frowning. “Here’s the plan: we’ll tell everybody that this is just a. dress rehearsal, but complete in all details, road blocks, rations, reporters, check-off lists, the works. Doc, you get the power plant ready. Red, you’re in charge of loading. Me, I’m going into Mojave and phone Hastings. Then I’ll phone the University and arrange for the big computer.” “Why drive twenty miles?” Corley protested. “Call from here.” “Because these wires are probably tapped —and I don’t mean the F.B.I.! Aside ffom us three and Ward, Hastings is the one man who must know the truth— when he figures that

ballistic, he's got to know it matters." Barnes reached for his hat. "Doc, you can call Ward now—here I go." "Wait!" said Bowles. "Jim, you're going off half cocked. You can at least find out from here where Hastings is. You may have to fly down to Palomar and get him." Barnes snapped his fingers. "I am half cocked, Red. I forgot the most important item—the reason why I can't use my plane myself; I need it for the Resident Inspector." He referred to the project representative of the Atomic Energy Commission. "Holmes? Why does he need your plane?" "To get lost in. I'm going to persuade Ned Holmes to go to Washington and make one last plea for us to be allowed to test our engine here. He'll do it; turning us down wasn't his idea. Our boy Andy will fly him in my plane—and Andy will be forced down in the desert, forty miles from a phone. Very sad." Corley grudged a smile. "Sounds like kidnapping." Barnes looked innocent. "Of course Holmes will put the Commission's seal on the power pile before he leaves." "And we'll break it. Any more objections? If not, let's get Andy, Holmes, and Ward, in that order." Admiral Bowles whistled. "Doc," he said, "that engine of yours had better work, or we will spend the rest of our lives in jail. Well, let's get busy." II The morning was well worn by the time Jiiii Barnes drove back to the construction site. The company guard at the pass gate waved him through; he stopped nevertheless. "Howdy, Joe." "Morning, Mr. Barnes." "I see the gate is open. Any orders from the front office?" "About the gate? No. Somebody called and said today was dress rehearsal for the Big Boy." The guard hooked a thumb toward the ship, two miles away. "That's right. Now listen; this dress rehearsal must be letter perfect. Keep that gate locked. Clear with me, or Admiral Bowles, or Doctor Corley himself before unlocking it." - "Gotcha, Mr. Barnes." "Just remember that there are people who would do anything to keep that ship over there from leaving the ground—and they don't necessarily have foreign accents." "Pon't worry, Mr. Barnes." But he did worry; corking up the gate still left fourteen miles of unguarded fence. Oh, well—it was a risk that must be accepted. He drove on past the living quarters, through the circle of shops. The area swarmed with people, on foot, in trucks, in jeeps. Trucks were lined up at the entrance to the bull pen surrounding the ship itself. Barnes pulled up at the administration building. In Corley's office he found Bowles, Corley himself— and Corley's wife. Corley looked harassed; Mrs. Corley was quite evidently angry. "Greetings, folks," he said. "Am I butting in?" Corley looked up. "Come in, Jim." Barnes bowed to Mrs. Corley. "How do you do, ma'am?" She glared at him. "You! You're responsible for this!" "Me, Mrs. Corley? For what?" "You know very well 'what'! Oh you.. . you. . ." She caught her breath, then gave vent to one explosive word: "Men!" She slammed out of the room. When the door had closed

behind her, Barnes let his eyebrows seek their natural level. “I see she knows. You shouldn’t have told her, not yet, Doe.” “Confound it, Jim. I didn’t expect her to kick up a fuss.” Bowles faced around in his chair. “Don’t be a fool, Jim. Doe’s wife had to know—wives aren’t hired hands.”· “Sorry. The damage is done. Doc, have you put any check on phone calls?” “Why, no.” “Do it. Wait, I’ll do it.” He stepped to the door. “Countess, call our switch board. Tell Gertie to switch all outgoing calls to you. You tell ‘em firmly that outside lines are all in use, find out who it is, why they want to call, and whom—then tell the Director, Admiral Bowles, or me. Same for incoming calls.” He closed the door and turned back to Bowles. “Your wife knows?” “Of course.” “Trouble?” “No. Navy wives get used to such things, Jim.” “I suppose so. Well, I got Hastings squared away. He says that he will be here with the tape not later than two in the morning. Ive got a plane standing by for him.” Corley frowned. “That’s cutting it fine. We ought to have more time to set up the autopilot.” “He says he can’t promise it sooner. How about things here?” “Loading is coming all right,” answered Bowles, “provided the trucks with the oxygen aren’t late.” “You should have flown it in.” “Quit uttering. The trucks are probably in Cajon Pass this minute.” “Okay, okay. Power plant, Doe?” “I haven’t broken Ned Holmes’ seal on the atomic pile yet. The water tanks are filling, but they’ve just started.” He was interrupted . by the telephone at his elbow. “Yes?” His secretary’s voice sounded in the room. “Your wife wants to call long distance, Doctor. I’m stalling her. Are you in?” “Put her on,” he said wearily. Mrs. Corley’s words could not be heard, but her angry tones came through. Corley answered, “No, dear. . . That’s right, dear. I’m sorry but that’s how it is. . . no, I don’t know when the lines will be free; we’re holding them for calls placed to the east coast. . . no, you can’t have the car; I’m using it. I —” He looked surprised and replaced the instrument. “She hung up on me.” “See what I mean?” said Barnes. “Jim, you’re a fool,” Bowles answered. “No, I’m a bachelor. Why? Because I can’t stand the favorite sport of all women.” “Which is?” “Trying to geld stallions. Let’s get on with the job.” “Right,” agreed Corley and flipped a key on his Teletalk. “Helen, call the electronics shop and tell Mr. Ward that I want to see him.” “Haven’t you broken the news to him?” demanded Barnes. “Ward? Of course.” “How did he take it?” “Well enough. Ward is high strung. At first he insisted there wasn’t time to get all the electronic gear ready.” “But he’s in?” “He’s in.” Corley stood up. “I’ve got to get back into the ship.” - “Me, too,” Bowles agreed. Barnes followed them out. As they passed the desk of Corley’s secretary she was saying, “One moment, puhlease—I’m ringing him.” She looked up and pointed to Corley. Corley hesitated. “Uh, uh,” said Barnes, “if you let ‘em tie you up on the phone, we’ll never take off. I’m elected. Go

on, you two. Get the buggy ready to go." "Okay." Corley added to his secretary, "Got Mr. Ward yet?" "Not in the electronics shop. I'm chasing him." "I want him right away." Barnes went back inside and spent an hour handling a logjam on the telephone. Personal calls he simply stalled on the excuse that the lines were needed for priority long distance calls. I-f a call was concerned with getting the ship ready to go, he handled it himself or monitored it. As best he could he kept the construction site an island, cut off from the world. He straightened out a matter with the chief metallurgist, gave the accounting office an okay on some overtime of the week before, assured Associated Press that the "dress rehearsal" was worth full coverage, and gleefully extended an invitation to the Los Angeles Associated Civic Clubs to go through the ship—next week. That done, he took Corley's dictaphone and began a memorandum to his business manager on how to close the project in case (a) the trip was successful, (b) the ship crashed. He planned to mark it to be transcribed the following day. - A call from Dr. Corley interrupted him. "Jim? I can't find Ward." "Tried the men's wash rooms?" "No—but I will." "He can't be far away. Anything wrong in his department?" "No, but I need him." "Well, maybe he's finished his tests and gone to his quarters to catch some sleep." "There's no answer from his quarters." "Phone could be off the hook. I'll send someone to dig him out." "Do that." While he was arranging this, Herbert Styles, public relations chief for the project, came in. The press agent slumped down in a chair and looked mournful. "Howdy, Herb." "Howdy. Say, Mr. Barnes, let's you and me go back to Barnes Aircraft and quit this crazy dump." "What's biting you, Herb?" "Well, maybe you can make some sense out of what's going on. They tell me to get everybody in here by three A.M.—A.P., U.P., INS, radio chains, television trucks, and stuff. Then you lock the joint up like a schoolhouse on Sunday. And all this for a practice drill, a dry run. Who's crazy? Me or you?" Barnes had known Styles a long time. "It's not a drill, Herb." "Of course not." Styles ground out a cigarette. "Now how do we play it?" "Herb, I'm in a squeeze. We're going to take off—at three fifty-three tomorrow morning. If word gets out before then, they'll find some way to stop us." "Who's 'they'? And why?" "The Atomic Energy Commission for one—for jumping off with an untested power-pile ship." Styles whistled. "Bucking the Commission, eh? Oh, brother! But why not test it?" Barnes explained, concluding with, "—so we can't test it. I'm busted, Herb." "Isn't everybody?" "That isn't all.. Call it a hunch, or anything you like. If we don't take off now, we never will—even if I had the dinero to test in the South Pacific. We've had more than our share of bad luck on this project—and I don't believe in luck." "Meaning?" "There are people who want this enterprise to fail. Some are crackpots; some are jealous. Others—"

“Others,” Styles finished for him, “don’t like the United States getting space travel first any better than they liked us getting the atom bomb first.” “Check.” “So what do you want to guard against? A time bomb in the ship? Sabotage of the controls? Or the Federal marshal with a squad of soldiers to back him up?” “I don’t know!” - Styles stared at nothing. “Boss—” “Yeh?” “Item: pretty soon you’ve got to admit publicly that it’s a real takeoff, for you’ve got to evacuate this valley. The sheriff and state police won’t play games just for a drill.” “But—” “Item: by now it is after office hours on the east coast. You’re fairly safe from the Commission until morning. Item: any sabotage will be done on the spur of the moment, provided it isn’t already built into the ship.” “Too late to worry about anything built into the ship.” “Just the same, if I were you, I would go over her with a toothpick. Any last minute stuff will be done with a wrench, behind a control panel or such—what they used to call ‘target of opportunity.” “Hard to stop.” “Not too hard. There isn’t anything that can be done to that ship down at its base, right? Well, if my neck depended on that heap, I wouldn’t let anybody up inside. it from now on, except those going along. Not anybody, not even if he carried a certificate of Simon-pure onehundred-percentism from the D.A.R. I’d watch what went in and I’d stow things with my own little pattypaws.” Barnes chewed his lip. “You’re right. Herb—you just bought yourself a job.” “Such as?” “Take over here.” He explained what he bad been. doing. “As for the press, don’t tip them off until you have to make arrangements for the road blocks and evacuation—maybe you can keep things wrapped up until around midnight. I’m going up into that -ship and—” The telephone jangled; he picked it up. “Yes?” It was Bowles. “Jim—come to the electronics shop." “Trouble?” “Plenty. Ward has run out on us.” “Oh, oh! I’ll be right over.” He slammed the phone and said, “Take over, Herb!” “Wilco!” Outside, he jumped in his car and swung around the circle to the electronics shops. He found Bowles and Corley in Ward’s office. With them was Emmanuel Traub,, Ward’s first assistant. “What happened?” Corley answered, “Ward is in the hospital—acute appendicitis.” Bowles snorted. “Acute funk!” “That’s not fair! Ward wouldn’t run out on me.” Barnes cut in. “It doesn’t matter either way. The question is: what do we do now?” Corley looked sick. “We can’t take off.” “Stow that!” Barnes turned to Bowles. “Red, can you handle the electronics?” “Hardly! I can turn the knobs on an ordinary twoway —but that ship is all electronics.” “I’m in the same fix—Doc, you could. Or couldn’t you?” “Uh, maybe—but I can’t handle radar and power plant both.” “You could teach me to handle power plant and Red could pilot.” “Huh? I can’t make a nucleonics technician out of you in something like a matter of hours.” Barnes seemed to feel the world pressing in on him. He shook off the feeling and turned to

Traub. “Mannie, you installed a lot of the electronic gear, didn’t you?” “Me? I installed all of it; Mr. Ward didn’t like to go up the Gantry crane. He is a nervous type guy.” Barnes looked at Corley. “Well?” Corley fidgeted. “I don’t know.” Bowles said suddenly, “Traub, where did you go to college?” Traub looked hurt. “I got no fancy degree but I carry a civil service classification of senior electronics engineer—a P-5. I did three years in the Raytheon labs. I had my ham license since I was fifteen, and I was a master sergeant in the Signal Corps. If it makes with electrons, I savvy it.” Barnes said mildly, “The Admiral didn’t mean any harm, Mannie. What do you weigh?” Traub shifted - his eyes from one *0 the other. “Mr. Barnes—this is no rehearsal? This is it?” “This is it, Mannie. We take off—” He glanced at his watch. “—in thirteen hours.” - Traub was breathing hard. “You gentlemen are asking me to go to the Moon with you? Tonight?” - Before Barnes could answer, Bowles put in: “That’s it, Mannie.” Traub swallowed hard. “Yes,” he said. “Yes?” Barnes echoed.. “I’ll go.” Corley said hastily, “Traub, we don’t want to rush you.” “Director, take a look at my job application. I put down ‘Willing to travel.” III The great ship was ringed with floodlights spaced inside the bull pen. It was still framed by the skeleton arch of the Gantry crane, but the temporary anti-radiation shield which had surrounded its lower part down to the jets was gone; instead there were pOsted the trefoil signs used to warn of radioactivity—although the level of radiation had not yet become dangerously high. - But the power pile was unsealed and the ship was ready to go. Thirteen-fifteenths of its mass was water, ready to be flashed into incandescent steam by the atomic pile, to be thrown away at thirty thousand feet per second. - High up in the ship was the control room and adjacent airlock. Below the air lock the permanent anti-radiation shield ran across the ship, separating the pressurized crew space from the tanks, the pumps, the pile itself, and auxiliary machinery. Above the control room, the nose of the craft was unpressurized cargo space. - At its base triangular airfoils spread out like oversize fins—fins they would be as the ship blasted away; glider wings they would become when the ship returned to Earth with her tanks empty. Jim Barnes was at the foot of the Gantry crane, giving last-minute orders. A telephone had been strung out to the crane; it rang and he turned to answer it. “Mr. Barnes?” “Yes, Herb.” “Sheriff’s office reports road blocks in place and everybody out of the valley—it cost plenty cumshaw to clear the Idle Hour Guest Rancho, by the way.” “No matter.” “Everybody out, that is, but Pete the Hermit. He won’t git.” “The old boy with the whiskers in that shack north of the gate?” - “The same. We finally told him the score, but it didn’t faze him. He says he ain’t never seen no ship take off for the Moon and he ain’t planning to miss it, not at his age.” Barnes chuckled. “Can’t

blame him. Well, let him sign the release our own people sign. Tell him if he won't sign, the show won't take place." "And if he doesn't sign?" "Herb, I take off even if some damn fool is standing under the jets. But don't tell him." "I got you. Now bow about the press?" "Tell them now—but keep them off my neck. And even with releases they stay in the blockhouse." "I'll have trouble with the fiewsreel and television people." "Remote control or nothing. Herd 'em in, -you go in last and lock the door behind you. They can string all the wires into the blockhouse they need, but nobody stays inside the area unsheltered." "Mr. Barnes—do you really think the blast will be that dangerous?" Barnes' reply was drowned out by the bull horn from the blockhouse: "Attention! The last bus is now loading at the north entrance to the shop circle!" Presently Styles resumed: "Another call—you better take it, boss. Trouble." "Who is it?" "Commanding general at Muroc." "Put him on." In a moment he was saying, "Jim Barnes, General. How are you?" "Oh—hello, Mr. Barnes. I hate to buck you, but your man seems unreasonable. Is it necessary to ask us to keep radar crews up all night for your practice drill?" "Mmm .-. . General, isn't your tracking radar always manned anyhow? I thought this country had a 'radar umbrella' over it." The general answered stiffly, "That's not a proper question, Mr. Barnes." "I suppose not. Big difference between passing a law and getting appropriations to carry it out, isn't there?" He thought a minute. "General, suppose I guarantee blips on your tracking screens?" "What do you mean?" Barnes said, "General, I've known you since open cockpits. You've used a lot of my planes~" "You make good planes, Mr. Barnes." "Tonight I want some cooperation. This is it, Whitey." "Huh?" "We blast -off tonight. As long as you know, you can call White Sands and make sure they track us, too. And Whitey—" - "Yes, Jim?" "What with getting your crew organized and calling White Sands it will be another hour before you can call Washington, wouldn't you think?" Silence persisted so long that Barnes thought he - had been cut off, then the general answered, "It might take that long. Anything more you had better tell me?" "No. . . that's enough. Except one thing; I'm going, Whitey. I'm piloting it." "Oh. Good luck, Jim." "Thanks, Whitey." As Barnes turned away, he saw a plane circling the area, its lights blinking. The elevator creaked behind him; he looked up to see Corley, Bowles, and Traub descending. Corley shouted, "Is that Dr. Hastings?" "I hope so." The plane landed and a jeep drove up to it. A few minutes later the jeep swung into the bull pen and up to the crane; Doctor Hastings got out. Corley ran to meet him. "Doctor Hastings! You have it?" "Greetings, gentlemen. Yes, indeed." Hastings tapped a bulging pocket. "Give it to me!" "Suppose we go into the ship? I'd like to discuss it with you." "Jump aboard." The two savants mounted the elevator and started up.

Admiral Bowles touched Barnes' sleeve. "Jim—a word with you." "Shoot." Bowles indicated Traub with his eyes; Barnes caught the meaning and they moved inside. "Jim," Bowles asked in a whisper, "what do you know about this man Traub?" "Nothing that you don't. Why?" "He's foreign born, isn't he? Germany? Poland?" "Russia, for all I know. Does it matter?" Bowles frowned. "There's been sabotage, Jim." "The hell you say! What sort?" "The earth-departure radar wouldn't function. Traub opened up the front, then called me over." "What was it?" "A pencil mark drawn between two leads. It—" "I get you, a carbon short. Sabotage, all right. Well?" "My point is, he found it too easily. How would he know right where to find it if he didn't do it himself?" Barnes thought about it. "If Traub is trying to stop us, all he has to do is to refuse to go. We can't go without him—and he knows it." "Suppose his object was not just to stop us, but to wreck the ship?" "And kill himself in the bargain? Be logical, Red." "Some of those people are fanatics, Jim. Beyond logic." Barnes considered it. "Forget it, Red." "But—" "I said, 'Forget it!' Get on back in that ship and prowl around. Imagine that you are a saboteur, try to think where you would hide a bomb—or what you would wreck." "Aye, aye, sir!" "Good. Mannie!" "Yes, Mr. Barnes." Traub trotted up; Barnes told him to go up and continue checking. The phone at the foot of the crane rang; it was Styles again. "Boss? Just got a call from the pass gate. The deputy there is hooked by car radio with the deputies at the road blocks—" "Good. Nice organizing, Herb." "Not good! The north road black reports a car with a bailiff; he has a federal court order to stop the takeoff. They let him through." Barnes swore softly. "Call, the pass gate. Tell the deputy there to stop him." "I did. He won't. He says he can't interfere with federal business." "That tears it!" Barnes stopped to think. "Tell him to make almighty sure that the man is what he says he is. Tell him that the court order is almost certainly phony-which it is. Tell him to hold the man while he gets in touch with the sheriff's office and has the sheriff phone the judge who is supposed to have issued the described order." "I'll try," Styles answered, "but suppose the order is kosher, boss? Hadn't I better just put the slug on him and dump him in a closet until the fireworks are over?" Barnes weighed this. "No—you'd spend your life breaking rocks. Gain me all the minutes you can—then hightail it for the blockhouse. Is everybody clear?" "Everybody but the car and driver for Mrs. Corley." "How about Admiral Bowles' wife?" "He sent her off earlier—the Admiral doesn't like ships watched out of sight." - "Bless his superstitious heart! Send Mrs. Corley's car into the pen. I'm going to button up around here." "Roger!" Barnes turned around to find Corley and Hastings descending. He waited, bursting with impatience. Corley spoke as they reached bottom. "Oh, Jim, I—" "Never mind! Is

everything okay up there?" "Yes, but—" "No time! Say good-bye to your wife, Doctor Hastings —good-bye, and thanks! Your plane's waiting." "Jim," protested Corley, "what's the rush? It's—" "No time!" A car swung in through the gate of the pen, came toward them. "There's your wife. Say good-bye and get back here. Move!" Barnes turned away and went to the crane operator. "Barney!" - "Yeah?" "We're going up now—for the last time. As soon as we are off the crane, back it-away. —The safety stops are off the tracks?" "Sure." "Off entirely, or just moved back?" "Off entirely. Don't worry; I won't run her off the rails." "Yes, you will. Run the crane right off the end." "Huh? Mr. Barnes, if I dropped the wheels into the sand, it would take a week to get her back on." "Check. That's exactly what I want. After you do it, don't stop to explain; just run for the blockhouse." The operator looked baffled. "Okay—you said it." Barnes came back to the elevator. Corley and his wife were standing near her car. She was crying. Barnes shaded his eyes against the floodlights and tried to see the road to the pass gate. The foundry cut off his view. Suddenly headlights gleamed- around that building, turned onto the shop circle and came toward the bull pen entrance. Barnes shouted, "Doc! Now! Hurry!" Corley looked up, then hastily embraced his wife. Barnes shouted, "Come on! Come on!" Corley waited to hand his wife into the car. Barnes climbed onto the elevator and, as Corley reached it, pulled him aboard. "Barney! UP!" Cables creaked and groaned; the platform crawled upward. As Mrs. Corley's car approached the gate the other car started -in. Both cars stopped, then th& strange car bulled on throUgh. It 'gunned in second toward the crane and slammed to a stop; a man swarmed out. He ran to the elevator, the platform was thirty feet above his head. He waved and shouted. "Barnes! Come down here!" Barnes shouted back, "Can't hear you! Too much racket!" "Stop the elevator! I've got a court order!" The driver of the car)umped out and ran toward the crane control station. Barnes watched, unable to stop whatever was to come. Barney reached behind him and grabbed a wrench; the driver stopped short. "Good boy!" Barnes breathed. The elevator reached the airlock door; Barnes nudged Corley. "In you go!" He followed Corley, turned and lifted the gangway off the lip of the door, shoved it clear with his foot. "Barney! Get going!"' The crane operator glanced up and shifted his controls.'The crane quivered, then very slowly crawled back from the ship, cleared it, and continued. It backed still farther, lurched out of plumb, and trembled. Its drive motor squealed and stopped. Barney slid out of his saddle and loped away toward the gate. IV Time checks had been completed with Muroc, with White Sands and with their blockhouse. The control room was quiet save for the sighing of'air-replenishing equipment, the low hum of radio circuits, and stray

sounds of-auxiliary machinery. The clocks at each station read 3:29—twenty-four minutes to H-hour. - The four were at their stations; two upper bunks were occupied by pilot and co-pilot; the lowers by power engineer and electronics engineer. Across the lap of each man arched a control console; his arms were supported so that his fingers were free to handle his switches without lifting any part of his body against the terrible weight to come. His head was supported so that he might see his instruments. Traub lifted his head and peered out one of the two large quartz ports. “It’s clouding up. ‘1 can’t see the -~ Moon.” Barnes answered, “Out where we’re going there won’t be any clouds.” “No clouds?” “What do you expect, out in space?” “Uh, I don’t know. I guess I got most of my ideas about space travel from -Buck Rogers. Electronics is my game.” “Twenty-three minutes,” announced Bowles. “Skipper, what’s the name Of this bucket?” “Huh?” “When you launch a ship you have to name her.” “Eh, I suppose so. Doc, what do you say? She’s your baby.” “Me? I’ve never thought about it.” “How,” Bowles went on, “about calling her the Luna?” Corley considered. “Suits me, if it suits the rest of you.” “The space ship Luna, “ agreed Barnes. “Sounds good.” Traub chuckled nervously. “That makes us ‘the Lunatics.'" “And why not?” agreed Barnes. “Twenty minutes,” announced Bowles. “Warm her up, Doc. Check-off lists, everybody." “She’s hot now,” Corley answered. “If I increase the fission rate, I’ll have to give her something to chew. Jim, I’ve been thinking. We could still test her.” “Huh?” “Set her for a half-g lift, and clear her throat once I’ve got her set for that.” “What’s the point? She’ either works, or she blows up.” “Okay,” Corley answered. Traub gulped. “Could she blow up?” “Don’t worry,” Cqrley reassured him. “The scale model ran an hour and twenty-three minutes before it blew up.” “Oh. Is that good?”~ - “Mannie,” Barnes ordered. “Switch on ‘Ground PickUp.’ We might as well watch.” “Yes, sir.” Above them was a large TV screen. Traub could hook it in to a scanner in the tail, another in the nose, or —as now—pick up an ordinary video channel. The screen lighted up; they saw their own ship, lonely and tall in the floodlights. An announcer’s voice came with the picture: “—this ship, the mightiest ever built, will soon plunge into outer space. Its flight was unannounced until tonight, its destination has not been revealed. Is this—” The broadcast was interrupted by Herb Styles. “Mr. Barnes! Boss!” Barnes leaned out and looked at Traub in the couch beneath. “Are you hooked in?” "Just a sec—go ahead.” “What is it, Herb?” “Somebody tearing down the road, heading this way.” “Who?” - “Don’t know. We can’t contact the north road block.” “Call the pass gate. Head ‘em off.” “It’s no longer manned. Hey—wait. North road block coming in.” After a pause, Styles yelled, “Truck loaded with men —they crushed through and ran over a deputy!” “Keep your shirt on,”

cautioned Barnes. “They can’t reach us. If they hang around down below, it’s their misfortune. I’m blasting on time.” Bowles sat up. “Don’t be too sure, Jim.’~ “Eh? What can they do to us now?” “What would six sticks of dynamite against one of the tail jacks do to this ship? Let’s take off—now!” “Before calculated time? Red, don’t be silly.” “Blast off and correct later!” “Doe—could we do that?” “Eh? No!” Barnes stared at the TV picture. “Mannie—tell blockhouse to sound sirens!” “Jim,” protested Corley, “you can’t take off now!” “Are you still set up to test? Half g?” “Yes, but—” “Stand by!” His eyes were fixed on the pictured scene outside; headlights came around the foundry, sped toward the pen. The moaning of sirens drowned out Corieyas answer. The truck was almost at the gate. Barnes’ forefinger stabbed the firing button. A whine of great pumps was blanked out by a roar they could feel in their bones. The Luna shivered. In the TV screen a flower of white light burst from the tail of the ship, billowed up, blanketing the headlights, the buildings, the lower half of the ship. Barnes jerked his finger back. The noise died out; the cloud changed from incandescent to opaque. In the silence Styles’ voice came over the speaker. “Great— Day—in the Morning!” “Herb—can you hear me?” “Yes. What happened?” “Use the bull horn to warn them off. Tell ‘em to scram; if they come closer I’ll fry them.” “I think you have.” “Get busy.” He watched the screen, his finger raised. The cloud lifted; he made out the truck. “Nine minutes,” Bowles announced, calmly. Through the speaker Barnes could hear a voice on the bull horn, warning the attacking party back. A man jumped down from the truck, was followed by others. Barnes’ finger trembled. They turned and ran. Barnes sighed. “Doc, did the test suit you?” “A mushy cutoff,” Corley complained. “It should have been sharp.” “Do we blast, or don’t we?” Corley hesitated. “Well?” demanded Barnes. “We blast.” Traub heaved a mournful sigh. Barnes snapped, “Power plant—shift to automatic! All hands—prepare for acceleration. Mannie, tell blockhouse, Muroc, and White Sands to stand by for count off at oh three five two.” “Oh three five two,” Traub repeated, then went on, “Ship~ calling blockhouse, Muroc, White Sands.” “Power plant, report.” “Automatic, all green.” “Co-pilot?” “Tracking on autopilot.” Bowles added, “Eight minutes.” “Doc, is she hot as she’ll take?” “I’m carrying the fission rate as high as I dare,” Corley answered, strain in his voice. “She’s on the ragged edge.” “Keep her so. All hands, strap down.” Corley reared up. “Jim—I forgot to pass out the drop-sick pills.” “Stay where you are! If we get seasick, we get seasick.” “One minute, coming up!” Bowles’ voice was harsh. “Take it, ‘Mannie!” “Blockhouse—Muroc—White Sands. Ready for count off!” Traub paused; the room was still. “Sixty! Fifty-nine—fifty-eight—fifty-seven —” Barnes gripped his arm rests, tried to slow down his heart. He

watched the- seconds click off as Traub counted them. “Thirty-nine! Thirty-eight! Thirty-seven!” Traub’s voice was shrill. “Thirty-one! Ha/ fl” Barnes could hear sirens, rising and falling, out on the field. Above him in the TV screen, the Luna stood straight and proud, her head in darkness. “Eleven" “And ten" “And nine!" “And eight!”—Barnes licked his lips and swallowed. “Five—four—three - two— “Fire!” The word was lost in sound, a roar that made the test blast seem as nothing. The Luna shrugged—and climbed for the sky. V If we are to understand those men, we must reorient. Crossing the Atlantic was high adventure—when Columbus did it. So with the early spacemen. The ships they rode in were incredibly makeshift. They did not know what they were doing. Had they known, they would not have gone. Farquharson, Ibid., III: 415 Barnes felt himself shoved back into the cushions. He gagged and fought to keep from swallowing his tongue. He felt paralyzed by body weight’of more than haifa ton; he strained to lift his chest. Worse than weight was noise, a mind-killing “white” sound from unbearable ultrasonics down to bass too low to be heard. The sound Dopplered down the scale, rumbled off and left them. At five effective gravities they outraced their own din in six seconds, leaving an aching quiet broken only by noise of water coursing through pumps. For a moment Barnes savored the silence. Then hi~ eyes caught the TV screen above him; in it was a, shrinking dot of fire. He realized that he was seeing himself, disappearing into the sky, and regretted that he had not watched the blast-away. “Mannie,” he labored, to say, “switch on ‘View After.” “I can’t,” Traub groaned thickly. “I can’t move a muscle.” “Do it!” Traub managed it; the screen blurred, then formed a picture. Bowies grunted, “Great Caesar’s ghost!” Barnes stared. They were high above Los Angeles; the metropolitan area was map sharp, picked out in street lights and neon. It was shrinking visibly. Rosy light flashed through the eastern port, followed at once by dazzling sunlight. Traub yelped, “What happened?” - Barnes himself had been startled but he strove to control his voice and answered, “Sunrise. We’re up that high.” He went on, “Doc—how’s the power plant?” “Readings normal,” Corley replied in tongue-clogged tones. “How long- to go?” Barnes looked at his board. “More than three minutes.” Corley did not answer, three minutes seemed too long to bear. Presently Traub said, “Look at the sky!” Corley forced his head over and looked. Despite harsh sunlight the sky was black and spangled with stars. At three minutes and fifty seconds the jets cut off. Like the first time, the cutoff was mushy, slow. The terrible weight left them gradually. But it left them completely. Rocket and crew were all in a free orbit “falling” upward toward the Moon. Relative to each other and to ship they had no weight. Barnes felt that retching, frightening “falling elevator” feeling characteristic of no

weight, but, expecting it, he steeled himself. “Power, plant,” he snapped, “report!” “Power plant okay,” Corley replied weakly. “Notice the cutoff?” “Later,” decided Barnes. “Co-pilot, my track seems high.” “My display tracks on,” wheezed Bowles, “—or a hair high.” “Mannie!” No answer. Barnes repeated, “Mannie? Answer, man—are you all right?” Traub’s voice was weak. “I think I’m dying. This thing is falling—oh, God, make it stop!” “Snap out of it!” “Are we going to crash?” “No, no! We’re all right.” “All right,’ the man says,’~ Traub muttered, then added, “I don’t care if we do.” Barnes called out, “Doc, get those pills. Mannie needs one bad.” He stopped to control a retch. “I could use one myself.” “Me, too,” agreed Bowles. “I haven’t been this seasick since I was—” He caught himself, then went on. “—since I was a midshipman.” Coriey loosened his straps and pulled himself out from his couch. Weightless, he floated free and turned slowly over, like a diver in slow motion. Traub turned his face away and groaned. - “Stop it, Mannie,” ordered Barnes. “Try to raise White Sands. I want a series of time-altitude readings.” “I can’t—I’m sick.” “Do it!” Corley floated near a stanchion, grabbed it, and pulled himself to a cupboard. He located the pill bottle and hastily gulped a pill. He then moved to Traub’s couch, pulling himself along. “Here, Traub—take this. You’ll feel better.” “What is it?” “Some stuff called Dramamine. It’s for seasickness.” Traub put a pill in his mouth. “I can’t swallow.” - “Better try.” Traub got it down, clamped his jaw to keep it down. Corley pulled himself to Barnes. “Need one, Jim?” Barnes started to answer, turned his head away, and threw up in his handkerchief. Tears streaming from his eyes, he accepted the pill. Bowles called out, “Doc — hurry up!” His voice cut off; presently he added, “Too late.” “Sorry.” Corley moved over to Bowles. “Criminy, you’re a mess!” - - “Gimme that pill and no comments.” Traub was saying in a steadier voice, “Spaceship Luna, calling White Sands. Come in White Sands.” At last an answer came back, “White Sands to Spaceship—go ahead.” “Give us a series of radar checks, time, distance, and bearing.” A new voice cut in, “White Sands to Spaceship—we have been tracking you, but the figures are not reasonable. What is your destination?” Traub glanced at Barnes, then answered, “Luna, to White Sands—destination: Moon.” “Repeat? Repeat?” “Our destination is the Moon!”. There was a silence. The same voice replied, “Destination: Moon’— Good luck, Spaceship .Luna!” Bowles spoke up suddenly. “Hey! Come look!” He had unstrapped and was floating by the sunward port. “Later,” Barnes answered. “I need this tracking report first.” “Well, come look until they call back. This is once in a lifetime.” - Corley joined Bowles. Barnes hesitated; he wanted very badly to see, but he was ashamed to leave Traub working. “Wait,” he called out. “I’ll turn ship and we can all see.” Mounted at the centerline of the

ship was a flywheel. Barnes studied his orientation readings, then clutched the ship to the flywheel. Slowly the ship turned, without affecting its motion along its course. “How’s that?” “Wrong way!” - “Sorry.” Barnes tried again; the stars marched past in the opposite direction; Earth swung into view. He caught sight of it and almost forgot to check the swing. Power had cut off a trifle more than eight hundred miles up. The Luna had gone free at seven miles per second; in the last few minutes they had been steadily coasting upwards and were now three thousand miles above Southern California. Below—opposite them, from their viewpoint—was darkness. The seaboard cities stretched across the port likeChristmas lights. East of them, sunrise cut across the Grand Canyon and shone on Lake Mead. Further east the prairies were in daylight, dun and green ‘broken by blinding cloud. The plains dropped away into curved skyline. So fast were they rising that the picture was moving, shrinking, and the globe drew into itself as a ball. Barnes watched from across the compartment. “Can you see all right, Mannie?” he asked. - “Yeah,”, answered Traub. “Yeah,” he repeated softly~ “Say, that’s real, isn’t it?” Barnes said, “Hey, Red, Doc—heads down. You’re not transparent.” Traub looked at Barnes. “Go ahead, skipper.” “No, I’ll stick with you.” - “Don’t be a chump. I’ll look later.” “Well—” Barnes grinned suddenly. “Thanks, Mannie.” He gave a shove and moved across to the port. Mannie continued to stare. Later the radio claimed his attention. “White Sands, calling Spaceship—ready with radar report.” The first reports, plus a further series continued as long as White Sands and Muroc were able to track them, confirmed Barnes’ suspicion. They were tracking “high,” ahead of their predicted positions and at speeds greater than those called for by Hastings’ finicky calculations. The difference was small; on the autopilot displays it was hardly the thickness of a line between the calculated path and the true path. But the difference would increase. “Escape speeds” for rockets are very critical Hastings had calculated the classical hundred-hour orbit and the Luna had been aimedjo reach the place where the Moon would be four days later. But initial speed is critical. A difference of less than one percent in ship speed at cutoff can halve—or double—the transit time from Earth to Moon. The Luna was running - very slightly ahead of schedule—but when it reached the orbit of the Moon, the Moon would not be there. Doctor Corley tugged at his thinning hair. “Sure, the cutoff was mushy, but I-was expecting it and I noted the mass readings. It’s not enough to account for the boost. Here—take a look.” - Corley was hunched at the log desk, a little shelf built wto the space between the acceleration bunks. He was strapped to a stool fixed to the deck in front of it. Barnes floated at his shoulder; he took the calculation and scanned it. “I don’t follow you,” Barnes said presently; “your expended

mass is considerably higher than Hastings calculated." "You're looking at the wrong figure," Corley pointed out. "You forgot the mass of water you used up in that -test. Subtract that from the total mass expended to get the effective figure for blast off—this figure here. Then you apply that—" Corley hesitated, his expression changed from annoyance to dismay. "Oh, my God!" - - - "Huh? What is it, Doc? Found the mistake?" "Oh, how could I be so stupid!" Corley started frenzied figuring. "What have you found?" Corley did not answer; Barnes grabbed his arm. "What's up?" "Huh? Don't bother me." - "I'll bother you with a baseball bat. What have you found?" - "Eh? Look, Jim, what's the final speed -of a rocket, ideal case?" "What is this? A quiz show? Jet speed times the logarithm of the mass ratio. Pay me." "And you changed the mass ratio! No wonder we're running 'high." - "Me?" "We both did—my fault as much as yours. Listen; you spilled a mass of water in scaring off that truckload of thugs—but Hastings' figures were based on us lifting that particular mass all the way to the Moon. The ship should have grossed almost exactly two hundred fifty tons at takeoff; she was shy what you had used—so we're going too fast." - "Huh? I wasted reaction mass, so we're going too fast? That doesn't make sense." Barnes hooked a foot into the legs of the stool to anchor himself, and did a rough run-through of the problem with slide rule and logarithm table. "Well, boil me in a bucket!" He added humbly, "Doc, I shouldn't have asked to be skipper. idon't know enough." Corley's worried features softened. "Don't feel that way, Jim. Nobody knows enough—yet. God knows I've put in enough time on theory, but I went ahead and urged you to make the blunder." "Doe, how important is this? The error is less than one percent. I'd guess that we would reach the Moon about an hour early." "And roughly you'd be wrong. Initial speed is critical, Jim; you know that!" "How critical? When do we reach the Moon?" Corley looked glumly at the pitiful tools he had with him—a twenty-inch log-log slide rule, seven place tables, a Nautical Almanac, and an office-type calculator which bore the relation to a "giant brain" that a firecracker does to an A-bomb. "I don't know. I'll have to put it up to Hastings." He threw his pencil at the desk top; it bounced off and floated away. "The question is: do we get there at'all?" "Oh, it can't be that bad!" "It is that bad." From across the compartment Bowles called out, "Come and get it—or I throw it to the pigs!" - But food had to wait while Corley composed a message to Hastings. It was starkly simple: OFF TRAJECTORY. USE DATA WHITE SANDS MUROC AND COMPUTE CORRECTION VECTOR. PLEASE USE UTMOST HASTE—CORLEY. After sending it Traub announced that he wasn't - hungry and didn't guess he would eat. Bowles left the "galley" (one lonely hot plate) and moved to Traub's couch. Traub had strapped himself into it to have stability

while he handled his radio controls. “Snap out of it, man,” Bowles advised. “Must eat, you know.” - - Traub looked gray. “Thanks, Admiral, but I couldn’t.” “So you don’t like my cooking? By the way, my friends call me ‘Red.’” “Thanks, uh—Red. No, I’m just not hungry.” Bowles brought his head closer and spoke in low tones. “Don’t let it get you, Mannie. I’ve been in worse jams and come out alive. Quit worrying.” - “I’m not worrying.” BOwles chuckled. “Don’t be ashamed of it, son. We all get upset, first time under fire. Come eat.” “I can’t eat. And I’ve been under fire.” “Really?” - “Yes, really! I’ve got two Purple Hearts to prove it. Admiral, leave me alone, please. My stomach is awful - uneasy.” - - Bowles said, “I beg your pardon, Mannie.” He added, “Maybe you need another seasick pilL” “Could be.” - “I’ll fetch one.” Bowles did so, then returned again shortly with a transparent sack filled with milk—to be exact,’ a flexible plastic nursing cell, complete with nipple. “Sweet milk, Mannie. Maybe it’ll comfort your stomach.” Traub looked at it curiously. “With this should go a diaper and a rattle,” he announced. “Thanks, uh— Red.” “Not at all, Mannie. If that stays down, I’ll fix you a sandwich.” He turned in the air and rejoined the others. VI The Luna plunged on; Earth dropped away; radio signals grew weaker—and still no word from Hastings. Corley spent the time trying endlessly and tediously to anticipate the answer he expected from Hastings, using the tools be had. Traub stood guard at the radio. Barnes and Bowles spent a lengthy time staring out the ports—back at the shrinking, cloud-striped Earth, forward at the growing gibbous Moon’and brilliant steady stars—until Bowles fell asleep in mid-sentence, a softly snoring free balloon. Barnes nudged him gently toward his couch and there strapped him loosely, to keep him from cluttering up the cramped cabin. He eyed ‘his own couch longingly, then turned to Traub instead. “Out of there, Mannie,” he ordered. “I’ll relieve you while you catch some shut-eye.” “Me? Oh, that’s all right, Skipper. You get some sleep yourself and I’ll take a rain check.” Barnes hesitated. “Sure you don’t want to be relieved?” “Not a bit. I feel—” He broke off and added, “Just aminute,” and turned to his controls. He was on earphones now, rather than speaker. He settled them in place and said sharply, “Go ahead, Earth.” - Presently Traub turned to Barnes: “Chicago Tribune— they want an exclusive story from you.” “No, I’m going to sleep.” Traub reported Barnes’ answer, then turned baCk. “How about the Admiral or Doctor Corley?” “The co-pilot is asleep and Doctor Corley is not to be disturbed.” “Mr. Barnes?” Traub’s manner was diffident. “Do you mind if they get one from mer’ Barnes chuckled. “Not at all. But stick them plenty.” As Barnes closed his eyes he could hear Traub dickering with some faceless negotiator. He wondered if Traub would ever get to spend the fee? What was a man

like Traub doing up here anyhow, in a ship headed nowhere inahellofahurry? - - For that matter, why was Jim Barnes here? - After his - interview, Traub continued guarding the radio. Signals grew fainter and presently reduced to garble. The room was quiet, save for the soft murmur of the air replenisher. - - - After a long time the radio came suddenly to life—NAA, Washington, Traub soon learned, had rigged a reflector to beam directly at them. “Can you take code groups?” he was asked. - He assured them that he could. “Despatch for Rear Admiral Bowles,” NAA rapped back at him. “Zero zero zero one: code groups follow—love, uncle, king, easy, roger—boy, able, dog, item, peter—” The groups continued for a longtime. - “Doctor Corley!” - Corley looked around vaguely, as if awakening in a strange place. “Eh? Yes, Mannie? I’m busy.” “Doctor Hastings calling.” - “Oh, fine,” Corley acknowledged. “Slide out of there and let me take it.” They changed places with effort, bothered by weightlessness. Traub felt a touch on his arm. “What is it, Mannie?” - He turned; Barnes and Bowles had waked -up and loosed themselves. “Howdy, Skipper. It’s Doctor Hastings.” “Good!” “Uh, Admiral—got something for you.” Traub hauled out the code dispatch. Bowles stared at it. Barnes remarked, “Race results?” - - - Bowles did not answer. He shoved himself toward the forward bulkhead, as far away as possible. He then took a thin book from an inner pocket, and started studying the message with the aid of the book. Barnes looked surprised but said nothing. Hastings’ report was short but not sweet. They would reach the Moon’s orbit where ‘planned, but more than fifty hours too soon—and would miss the Moon by more than 90,000 miles! Barnes whistled. “Hot pilot Barnes, they call me.” Corley said, “It’s no joke.” “I wasn’t laughing, Doe,” Barnes answered, “but there is no use crying. It will be tragic soon enough.” - Traub broke in. “Hey—what do you mean?” “He means,” Bowles said bluntly, “that we are headed out and aren’t coming back.” “On out? And out—out into outer space? Where the stars are?” “That’s about it.” - “Not that,” Corley interrupted, “I’d estimate that we would reach our farthest point somewhere around the orbit of Mars.” Traub sighed. “So it’s Mars, now? That’s not so bad, is it? I mean- they say people live on Mars, don’t they? All those canals and things? We can get another load of water and come back.” - “Don’t kid yourself, Mannie,” Bowles said. “Just be glad you’re a bachelor.” “A bachelor? Who said I was?” “Aren’t you?” “Me? I’m a very domestic type guy. Four kids—and married -fourteen years.” Corley looked stricken. “Mannie, I didn’t know.” “What’s that got to do with it? Insurance I’ve got, with a rocket experimentation rider. I knew this was no picnic.” - Barnes said, “Mannie, if! had known, I wouldn’t have asked you to go. I’m sorry.” He turned’to Corley, “When do we run out of water—and air?” Corley raised his voice.

“Please! Everybody! I -didn’t say we weren’t going to get back. I said —” - “But you—” “Shut up, Red! I said this orbit is no good. We’ve got to vector west, toward the Moon. And we’ve got to do it at—” He glanced at a clock. “Good grief! Seven minutes from now.” Barnes jerked his head ar~ind. “Acceleration stations, everybody! Stand by to maneuver!” VII The most treacherous maneuver known to space flight is a jet landing on an airless planet. Even today, it commands the highest pay, the most skilled pilots— Farquharson, Ibid., III: 418 For forty hours they fell toward the Moon. The maneuver had worked; one could see, even with naked eye, that they were closing with the Moon. The four took turns at the radio, ate and slept and talked and stared out at the glittering sky. Bciwles and Traub discovered a common passion for chess and played off the “First Annual Interplanetary Championship”—so dubbed by the Admiral —using pencil marks on paper. Traub won, four out of seven. Some two hundred thousand miles out the Luna slid past the,null point between Earth and Moon, and began to shape her final orbit. It became evident that the correction vector had somewhat overcompensated and that they were swinging toward the Moon’s western limb—”western” as seen from Earth: the Luna’s orbit would intersect her namesake somewhere on the neveryet-seen far side—or it was possible that the ship would skim the far side at high speed, come around sharply and head back toward Earth. Two principal styles of landing were possible—Type A, in which a ship heads in vertically, braking on her jets to a landing in one maneuver, and Type B, in which a ship is first slowed to a circular orbit, then stopped dead, then backed to a landing when she drops from the point of rest. - “Type A, Jim—it’s simplest.” Barnes shook his head. “No, Doc. Simple on paper only. Too risky.” If they corrected course to head straight in (Type A), their speed at instant of braking would be a mile and a half a second and an error of one second would land them 8000 feet above—or below!—the surface. - Barnes went on, “How about a modified ‘A’?” Modified Type A called for intentionally blasting too soon, then cutting the jets when the radar track showed that the ship hovered, allowing it to fall from rest, then blasting again as necessary, perhaps two or three times. “Confound it, Jim, a modified ‘A’ is so damned wasteful.” - “I’d like to get us down without wrecking us.” “And I would like us to get home, too. This ship was’ figured for a total change of twelve and a half miles per second. Our margin is paper thin.” “Just the same, I’d like to set the autopilot to kick her a couple of seconds early.” - - “We can’t afford it and that’s that.” “Land her yourself, then. I’m not Superman.” “Now, Jim—” “Sorry.” Barnes looked at the calculations. “But why Type A? Why not Type B?” “But Jim, Type B is probably ruled out. It calls for decelerating at point of closest approach and, as things stand now,

‘closest approach’ may be contact.” “Crash, you mean. But don’t be so damned conventional; you can vector into a circular orbit from any position.” “But that wastes reaction -mass, too.” “Crashing from a sloppy Type A wastes more than reaction mass,” Barnes retorted. “Get to work on a ‘B’; I won’t risk an ‘A.” - Corley looked stubborn. Barnes went on, “There’s a bonus with Type B, Doe—two bonuses.” “Don’t be silly. Done perfectly, it takes as much reaction mass as Type A; done sloppily, it takes more.” “I won’t be sloppy. Here’s your bonus: Type A lands us on this face, but Type B lets us swing around the Moon and photograph the back side before we land. How does that appeal to your scientific soul?” Corley looked tempted. “I thought about that, but we’ve got too little margin. It takes a mile and a half of motion to get down to the Moon, the same to get up—three miles. For the trip back I have to save enough mass to slow from seven miles a second to five before we dip into the atmosphere. We used up seven to blast off —it all adds up to twelve. Look at the figures; what’s left?” Barnes did so and shrugged. “Looks like a slightly fat zero.” “A few seconds of margin at most You could waste it on the transitions in a Type B landing.” “Now the second bonus, Doe,” Barnes said slowly. “The Type B gives you a chance to change your mind after you get into a circular orbit; the straight-in job commits you beyond any help.” Corley looked shocked. “Jim, you mean go back to Earth without landing?” Barnes lowered his voice. “Wait, Doc. I’d land on the Moon if I had enough in tanks to get down—and not worry about getting up again. I’m a bachelor. But there’s Mannie Traub. No getting around it; we stampeded him. Now it turns out he has a slew of kids, waiting for poppa to come borne. It makes a difference.” Corley pulled at his scalp lock. “He should have told us.” “If he had, we wouldn’t have taken off.” “Confound it, things would have been all right if I hadn’t suggested that you test the engine.” “Nonsense! If I hadn’t scared those babies off with a blast, they probably would have wrecked the ship.” “You can’t be sure.” “A man can’t be sure of anything. How about Traub?” “You’re right—I, suppose. Okay, we leave it up to Traub.” -- - - - From the other end of the compartment Traub looked around from his chess game with Bowles. “Somebody call me?” “Yes,” Barnes agreed. “Both of you. We’ve got things to decide.” Barnes outlined the situation. “Now,” he said, “Doe and I agree that, after we get into a circular orbit and have had time to add up what’s left, Mannie should decide whether we land, or just swing around and blast for home.” Bowles looked amazed, but said nothing. Traub looked flustered. “Me? It ain’t my business to decide. I’m the electronics department.” “Because,” Barnes stated, “you’re the only one with kids.” “Yes, but— Look here—is there really a chance that, if we landed, we wouldn’t be able to get back?” “Possible,” Barnes

answered and Corley nodded. “But don’t you know?” - “Look, Mannie,” Barnes countered, “we’ve got water in the tanks to land, take off, and return to Earth—but none for mistakes.” - “Yes, but you won’t make any mistakes, will you?” “I can’t promise. I’ve already made one and it’s brought us -to this situation.” - Traub’s features worked in agonized indecision. “But it’s not my business to decide!” Bowles spoke up suddenly. “You’re right; it’s not!” He went on, “Gentlemen, I didn’t intend to speak, because it never crossed my mind that we might not land. But now the situation demands it. As you know, I received a coded message. “The gist was this; our trip has caused grave international repercussions. The Security Council has been in ‘constant session, with the U.S.S.R. demanding that the Moon be declared joint property of the United Nations—” “As it should be,” Corley interrupted. “You don’t see the point, Doctor. Their only purpose is to forestall us claiming the Moon—we, who actually are making the trip. To forestall us, you understand, so ‘that the United States will not be able to found a base on the Moon without permission—permission that is certain~to be vetoed.” “But,” pointed out Corley, “it works both ways. We would veto Russia establishing a base on the Moon. Admiral, I’ve worked with you because it was a way to get on with my life’s ambition, but, to be frank, using the Moon as a rocket launching base—by anybody—sticks in my craw.” - - Bôwles turned red. “Doctor, this is not an attempt to insure the neutrality of the Moon; this is the same double-talk they used to stop world control of atomics. The commissars simply want to tie us up in legalisms until they have time to get to the Moon. We’ll wake up one morning to find Russia with a base on the Moon and us with none—and World War Three will be over before it starts.” - “But—Admiral, you can’t know that.” Bowles turned to Barnes. “Tell him, Jim.” Barnes gestured impatiently. “Come out of your ivory tower, Doe. Space travel is here now—we did it. There is bound to be a rocket base on the Moon. Sure, it ought to be a United Nations base, keeping the peace of the world. But the, United Nations has been helpless from scratch. The first base is going to belong to us—or to Russia. Which one-do you trust not to misuse the power? Us—or the Politburo?” - — - Corley covered his eyes, then looked at Bowles. “All right,” he said dully. “It has to be—but I don’t like it.” Traub broke the ensuing silence with “Uh,. I don’t see how this ties in with whether we land or not?” Bowles turned to him. “Because of this: the rest of that message restored me to active duty and directed me tO claim the Moon in the name of the United States—as quickly as possible. We would have what the diplomats call a fait accompli. But to claim the Moon I have to land!” - Traub stared. “Oh. I see.” Bowles went on in a gentle voice, “Mannie, this goes beyond you and me, or even your kids. The surest

way to make sure that your kids grow up in a peaceful, free world is to risk your neck right now. So we've got to land." Traub hesitated; Bowles went on, "You- see that, don't you? It's for your kids—and millions of other kids." Barnes interrupted him. "Red—quit working on him!" - "Eh?" "He'll make a free choice—after we've leveled off and looked the situation over." - - - "But, Jim, I thought we saw eye to eye. You told Doc—" "Pipe down! You've stated your case, now quit trying to work him up into being a martyr." Bowles turned bright red. "I must inform you, sir, that besides being returned to active duty I was given authority to commandeer this ship." - Barnes locked eyes with him. "You can take -your authority and—do whatever -you think proper with it. I'm skipper and will stay so as long as I'm alive." He looked around. "All hands—get ready for approach. Doe, go ahead with trial calculations, Type B. Mannie, warm up the pilot radar. Bowles!" - -Finally Bowles answered, "Yes, sir." - "Rig the autocamera in the starboard port. We'll take a continuous strip as we pass around the far side." "Aye aye, sir." Traub leaned from his couch and peered out the starboard port. "It's just like the other side." Barnes answered, "What did you expect? -Skyscrapers? Co-pilot, how do -you track?" - "Speed over ground—one point three seven. Altitude, fifty-one point two, closing slowly." "Check. I project closest approach at not less than twenty-one—no contact. What do you get?" - "Closer to twenty, but no contact." "Check. Take over orientation. I'll blast when altitude changes from steady -to opening." "Aye aye, sir!" - - - The Luna was swinging around the unknown far face of the Moon, but her crew was too busy to see much of the -craggy, devil-torn landscape. She was nearing her closest approach, travelling almost horizontally. She was pointed tail first, ready to blast back from ,a top speed of a mile and a half a second to a circular orbit speed of a mile a second. At Barnes' order Bowles gave his attention to placing her axis precisely horizontal. The television screen read "View Aft"; in- its center was a cross mark lying over a picture of the mountainous horizon they were approaching. He jockeyed the ship against the reaction of the flywheel, then steadied her by gyros when one cross line held steady on the horizon~ Barnes set his controls on semiautomatic, ready both to fire and cut off with one punch of the firing button. Into his autopilot he fed the speed change he wished to achieve. Altitude dropped to forty miles, to thirty, to less than twenty-five. "Power plant,". Barnes called out, "stand by for blasting!" "Ready, Jim," Corley reported quietly. "Electronics?" "Everything sweet, Skipper." Barnes watched ground speed with one eye, the radar altimeter with the other. . . twenty-three, it said... twenty-two. . . twenty-one and a half. Twenty-one point five., . twenty-one - point four— point four again—and again. Point five! and crawling up. His finger stabbed at

the firing button. The blast was fourteen seconds only, then it cut off, but in the same mushy fashion which it had before. Barnes shook his' head to clear it and looked at his board. Altitude twenty-one point five; ground speed, one plus a frog's whisker—they were in orbit as planned. He sighed happily. "That's all for now, troops. Leave everything hot but you can get out of your hammocks." Bowles said, "Hadn't I better stay and watch the board?" "Suit yourself—but they won't repeal the law of gravitation. Doe, let's see how much juice we have left." He glanced at a clock. "We've got an hour to make a decision. It will be almost half an hour before Earth is in sight again." "I don't like the way she cuts off," Corley complained. "Quit fretting. 1 used to have a car that sounded its horn every time I made a left turn." Bowles got a container of coffee, then joined Traub at the starboard port. They peered around the automatic camera and watched the moonscape slide past. "Rugged terrain," Bowles remarked. - Traub agreed. "There's. better stuff going to waste in California." They continued to stare out. Presently Bowles turned in the air and slithered back to his acceleration couch. "Traub!" - Mannie came to the desk. "Mannie," Barnes said, pointing at a lunar map, "we figure to land spang in the middle of the Earthside face—that dark spot, Sinus Medii. It's a plain." "You figure to land, then?" "It's up to you, Mannie. But you'll have to make up your mind. We'll be there in about—uh, forty minutes." Traub looked troubled. "Look, chief, you shouldn't—" - He was interrupted by Bowles' voice. "Captain! We are closing, slowly." "Are you sure?" "Quite sure. Altitude nineteen point three—correction: point two. . . closing." "Acceleration stations!" Barnes was diving toward his couch as he shouted. Traub and Corley followed him. As he strapped down Barnes called out, "Co-pilot—get a contact prediction. All hands, stand by for maneuvers." He studied his own board. He could not doubt it; they were in something less than a perfect circle. He was trying to make a prediction from his display when Bowles reported, "I make it contact in nine minutes, Captain, plus or minus a minute." Barnes concentrated. The radar track was jiggling as much as five or ten percent, because of mountains below them; the prediction line was a broad band. As near as he could tell, Bowles was right. "What now, Captain?" Bowles went on. "Shall I swing her to blast forward?" A slight nudge would speed up the ship, in effect, lift her, permit her to fall - around the Moon rather than- curve down. It would also waste reaction mass. Nine minutes. . . nine hundred miles, about. He tried to figure how many minutes it would be until they raised Earth over the horizon, ahead. - Seven - minutes, possibly—and Earth would be in sight. A landing at Sinus Medli was impossible but they still might land in sight of Earth without using more precious water to correct their orbit. "Mannie," he. snapped, "we

land in seven minntes—or we never land. Make up your mind.1" Traub did not answer. Barnes waited, while a minute coursed by. Finally he -said in a weary voice, "Co-pilot—swing to blast forward. All hands, prepare for departure." Traub suddenly spoke up. "That's what we came for, wasn't it? To land on the Moon? Well, let's land the damn thing!" Barnes caught his breath. "Good boy! Co-pilot, cancel that last. Steady ship for deceleration. Sing out when you see Earth." "Aye aye, sir!" - "There's Earth!" - - - - Barnes glanced up, saw, Terra pictured in the TV screen, rising behind a wall of mountains. Bówles went on, "Better land, Jim. You'll never get over those moun- tains." Barnes did not argue; their altitude was barely three miles now. He shouted, "Stand by. Red, start swinging as soon as I cut off." - "Right!" - - -- "Fire!" He stabbed the button. This maneuver was manual, intended only to stop their forward motion. He watched -his ground-speed radar while the -ship shivered—nine-tenths . . . seven . . . -five . . . four.;. three.. . two. . one . . . six-hundredths. He jerked his finger off just before it dropped to zero and prayed that a mushy cutoff would equal his anticipation He started to shout to Bowles, but the ship was already swinging. - - - - - Earth and the horizon swung up in the TV screen and out of sight. - For a crawling ten seconds, while they fell straight down, the Luna crept into position for a tail-first landing. They were less than three miles up- now. Barnes shifted scale from miles to feet and started his prediction. Bowles beat him to an answer. "Contact in seventy-two seconds, Skipper." Barnes relaxed. "See the advantage of a Type 'B' landing, Doe," he remarked cheerfully. "No hurry—just like an elevator." - "Quit gabbing and get us down," Corley answered taut1y~ - - "Right," Barnes agreed. "Co-pilot, predict the blast altitude." -His own hands were busy to the same end. Bowles answered, "Jim, yOu going manual or auto- matic?" - - "Don't know yet." Automatic firing was quicker, possibly more certain—but that mushy cutoff could bounce them like a pingpong ball. He steadied crosshairs on his autopilot display and read the answer: "Blast at five two oh feet. What do you get, Red?" "Check." Bowles added, "That's less than three seconds blast, Jim. Better make it automatic." "Tend to your knitting." "My mistake." Nearly forty seconds passed and they had fallen to eleven thousand feet before he decided. "Power plant, set for manual landing. Co-pilot, cover me at five hun dred feet." -- - - "Jim, that's too late," Bowles protested. "You will be covering me all of a tenth of a second - after I should fire." - Bowles subsided. Barnes grabbed a glance at the TV screen; the ground under them seemed level and there was no perceptible drift. He looked back at his board. "Correction—cover at five ten." "Five ten —right." The seconds clicked past; he had his finger poised over the button when Bowles shouted, "Jim—look at the screen!" He looked up

—the Luna, still carrying a trifle of drift, was now over a long crack, or riM—and they were about to land in it. Barnes jabbed the button. He let up at once; the Luna coughed to silence. The rill, canyon, or crevasse was still in sight but no longer centered. “Co-pilot—new prediction!” “What happened?” Corley demanded. - “Quiet!” - “Prediction,” Bowles chanted, “blast ‘at—at three nine oh.” - Barnes was adjusting verniers for his own prediction as Bowles reported. “Check,” he answered. “Cover at three seven oh.” He threw one glance at the TV screen. The crevasse was toward the edge of the screen; the ground below looked fairly smooth. Unquestionably the ship had a slight drift. All he could do was hope that the gyros would -keep them from toppling. “Brace for crash!” 480—450—400— He jabbed the button. The terrible pressure -shoved his bead back; be lost sight of the altimeter. He caught it again— 190—150— - 125— At “fifty” he snatched his finger away and prayed. The jet cut off sloppily as always. A - grinding jar slammed him more deeply into the cushions The ship lurched like an unsteady top—and stayed upright. Barnes found that he had been - holding his breath a long time. - VIII - Columbus found -a pleasant climate rich land docile natives. Nowhere in our System did explorers find conditions friendly to men—and - nowhere was this more brutally true than on our nearest neighbor. - Farquharson, Ibid., III: 420 Barnes felt dazed, as if wakening from a confusing dream. Bowles’ voice recalled him to the present. “Jacks are down, skipper. Unclutch the gyros?” He pulled himself together. “Check our footing first. I’ll—Say! We’re on the Moon!” Frantically he unstrapped. “We sure are!” answered Bowles. “A fine landing, Jim. I was scared.” “It was terrible, and you know it.” - - “We’re alive, aren’t we? Never mind—we made it.” Corley interrupted them. “Power plant secured.” Barnes looked startled. “Oh, sure. Traub, your department okay?” - Mannie answered weakly, “I guess so. I think I fainted.” - - “Nonsense!” Bowles reassured him. “Come on—let’s look.” The four crowded at the portside port and stared out across an umber plain, baking under an unchecked sun, now not far from zenith. Miles away, jutting up into black, star-studded sky, were the peaks they had seen. In the middle distance was a single pock mark, a crater a ‘mile or less across. Nothing else broke the flat desolation -. . . endless, lifeless waste, vacuum sharp and kiln dry. Traub broke the silence with an awed whisper. “Gosh, what a place! How long do we stay, Mr. Barnes?” “Not long, Mannie.” He tried to make his words carry conviction. “Doe,” he went on, “let’s check the mass ratio.” - - - “Okay, Jim.” Bowles went to the starboard port; one glance through it and he sang out, “Hey—see this.” They joined him. Below was the dark chasm in which they had almost landed. It ran close to the ship; one jack almost touched the edge. Barnes looked - down into its awesome

depths and felt no regret about expending mass to avoid it. - -. - Bowles stared at it. “I repeat, Jim,- a fine landing.” - “Too close for comfort.” Bowles pushed his face to the quartz and tried to see - farther ‘to right and left. “I’m turned around,” he complained. “Which way is Earth?” - - - “Earth is east, of course,” Corley -answered. - “Which way is east?” “Man, you certainly are confused. East is out the other port.” “But it can’t be. We looked out there first and Earth wasn’t in sight.” Bowles crossed back to the other port. “See?” - - Corley joined him. “That’s east,” he stated. “Look at the stars.” - - - Bowles looked. “But something is screwy. I saw Earth before we landed, in the screen. You saw it, didn’t you, Jim?” - “Yes, I saw it.” “You; Doe?” - “I was too busy. How high was it?” “Just rising. But I saw it.” - Corley looked at the sky, then at the mountains. “Sure, you did. And it’s there—back of those mountains.” Barnes whistled tonelessly. “That’s it. I’ve landed us a few miles too short.” Bowles looked whipped. “Out of line-of-sight,” he said dully. “I could claim it until hell freezes—and I can’t get the message back.” — - Traub looked startled. “We’re cut off from Earth? But I saw it, too.” - - - “Sure, you did,” agreed Barnes, “you saw it while we had altitude. Now we’re down too low.” “Oh.” Traub looked out. “But it isn’t serious, is it? Earth is back of those mountains—but it’s in the east; it will rise after a bit. How fast does the Moon turn? Twenty-eight days and something?” Barnes turned to Corley. “You tell him, Doe.” “Mannie—the Earth doesn’t rise or set.” “Huh?” - “The Moon keeps the same face to the Earth all the time. From any one spot, the Earth doesn’t move; it just hangs.” “Huh?” Traub raised his hands, stared at them; it could be seen that he was visualizing it, using his fists for Earth and Moon. “Oh—I get it.” He looked dismayed. “Say, that’s bad. That’s really bad.” “Snap out of it, Mannie,” Barnes said quickly. “If we · can’t contact Earth, we’ll just have to wait until we get back.” He said nothing about his own fears. Bowles smashed a fist into a palm. “We’ve got to contact Earth! It doesn’t matter whether we get back; four casualties is cheap. But to get a message through now—this message, that a United States vessel has landed and taken possession —can mean the salvation of the United States.” He turned to Corley. “Doctor, we have enough power to - lift us over those mountains,~ haven’t we?” “Eh? Why, yes.” “Then let’s do it—now.” He turned toward his couch. “Hold it, Red!” Bowles stopped; Barnes went on, “If we make one lift and drop, to near those mountains, you know what that does to our chances of getting back.” “Of course! It’s not important; we owe it to our country.” “Maybe so. Maybe not.” Barnes paused. “If it turns out that we don’t have enough juice left to break free of - the Moon, I’ll concede your point.” - “Jim Barnes, we can’t consider ourselves against the safety of our country.” “Speak for

yourself, Red. Conceded that a claim to the Moon might help out the State Department this week— again it might not. It might stimulate Russia into going all out for space travel while the United States stumbles along as before, proud that we claimed it, but unwilling to spend real money to make it stick." "Jim, that's sophistry." - "So? That's my decision. We'll try everything else first. You don't know you can't get a message through. Why don't you try?" "When we're not in line-of-sight? Don't be silly." "Earth is not far down behind those mountains. Find a place that is line-of-sight." "Oh. Now you make sense." Bowles looked-out at the mountains. "I wonder how far away they are?" "Tell you in a moment," Traub offered. "Wait till I swing the soup bowl around.-" He started for his couch. "Never mind, Mannie!" put in Barnes. "No—go ahead. It won't hurt- to know. But I wasn't talking about the mountains, Red. They are too - far away. But if you scout around, you may find a spot from which the mountains are low enough to let you see Earth. Or you might find some hills—we can't see all around from inside here. Mannie, is it possible to take out the radio and use it outside the ship?" - "Outside? Let me see— The transmitter is unpressurized; I guess I could jigger it. How about power?" Bowles said, "Doe, how much cable can we dig up?" Barnes cut in, "Find your spot, then we'll see what's needed." "Right! Jim, I'll go out at once. Mannie, come with me and we'll find a spot." "Outside?" Traub said blankly. - "Sure. Don't you want to be the first man to set foot on the Moon?" "Uh, I guess so." Traub peered out at the blazing unfriendly surface. Corley got an odd look; Barnes noted it and said, "One moment, Red. Doe is entitled to the honor of being first. After all, the Corley engine made it possible." "Oh, sure! Doe can be first down the ladder. Let's all go." "I'll go later," Barnes decided. "I've got work to do." "As you wish. Come on, Doe." - Corley looked shy. "Oh, I don't have to be first. We all did it, together." "Don't be modest. Into our suits—let's go!" Thoughts of military policy seemed to have left Bowles' mind; he was for the moment boyishly eager for adventure. He was already undogging the hatch that led down into the 'airlock. Barnes helped them dress. The suits were modifications of high-altitude pressure suits used by jet pilots—cumbersome, all-enclosing skins not unlike diving suits and topped off with "goldfish bowl" helmets. The helmets were silvered except for the face plates; a walkie-talkie radio, two oxygen bottles, and an instrument belt completed the main features of a suit. When they were dressed but not helmeted, Barnes said, "Stay in sight of the ship and each other. Red, when you shift from tank one to tank two, git for home and don't dawdle." - "Aye aye." "I'm going now." He gasketed their helmets, leaving Córley to the last. To him he said softly, "Don't stay long. · I need you." Corley nodded. Barnes fastened the doctor's helmet, - then

climbed up into the control room and closed the hatch. Corley waited until Barnes was clear, then said, “Check radios. Check instruments.” “Okay, Doctor,” Traub’s voice sounded in his earphones. - “Okay here,” added Bowles. “Ready for decompression?” They assented; Corley touched a button near the door; there came a muted whine of impellers. Gradually his suit began to lift and swell. The feeling was not new; he had practiced in their own vacuum chamber back at Mojave. Hç wondered how Traub felt; tbe first experieilce with trusting a Rube Goldberg skin could be frightening. “How are you doing, Mannie?” “All right.” “The first time seems odd, I know.” “But it’s not the first time,” Traub answered. “I checked these walkie-talkies in the chamber at the job.” “If yOu gentlemen are through chatting,” Bowles cut in, “you’ll note that the tell-tale reads ‘vacuum.” “Eh?” Corley turned and undogged the outer door. He stood in the door, gazing north. The aching, sun-drenched plain stretched to a black horizon. On his right, knife sharp in the airless moonscape, was the wall of mountains they had grounded to avoid. He lifted his eyes and made out the Big Dipper, midnight clear above a dazzling, noonday desert. - Bowles touched his arm. “One side, Doc. I’ll rig the ladder.” - - “Sorry.” - Bowles linked the ends of a rope ladder to hooks outside the door. Finished, he kicked the ladder out. “Go ahead, Doe.” - - “Uh, thanks.” Corley felt for the first rung. It was a clumsy business in the pressure suit. Finally he knelt, grasped the threshold, got a toe in and started down. It was awkward, rather than hard work. Suit and all, he weighed less than forty pounds. He found it easier to lower himself by his hands alone. He could not see below his chin, but the shape of the ship let him know his progress. Finally he was even with the jets. He lowered himself a bit more, felt for the ground—and kicked his toe into the lunar soil. Then he was standing on it. He stood there a moment, his heart pounding. He was trying to realize it, take it in, and found himself unable to do so. He had lived the moment too many thousands of - times in too many years of dreams. It was still a dream. A foot brushed his shoulder; he stepped back to avoid being stepped on by Traub. Soon Bowles joined them. “So this is it,” the Admiral said inanely and turned slowly around. “Look,-Mannie! Hills! Not far away.” Corley saw that Bowles was looking under the jets to the south. The plain was broken there with a sharp eruption of rock. Corley touched Bowles’ arm. “Let’s get away from the ship. Here where the jets splashed is probably a bit radioactive.” “Okay.” Bowles followed him; Traub brought up the rear. - Ix Columbus had one motive; Queen Isabella had another— Farquharson, Ibid., III: 421 On climbing back into the control room Barnes did not immediately get to work. Instead he sat down and thought. For the last—two days, was it? three days? four days, really—he had had no chance to collect his

thoughts, drop his public mask and invite his soul. He felt unutterably weary. He lifted his eyes to the mountains. There they stood, tall and forbidding, witnesses that he had accomplished his driving purpose. - To what end? To let Corley explore the dark outer reaches of science? To help Bowles insure the safety of western civilization—or perhaps hasten a new crisis? Or to make orphans of four kids whose old man was "a very domestic type guy" but could be shamed Into coming along? No, he knew it had been because Jimmy Barnes had been small for his age, clumsy with his fists, no decent - clothes—so he had to make more money, boss more men, build faster planes than anyone else. He, James A. Barnes, had reached the Moon because he had never been sure of himself, - He wondered about Mannie's kids and his stomach was a rock inside him. - - - He threw off the mood and went to the radio controls, keyed the walkie-talkie circuit and called out, "This is Jim Barnes, kiddies, coming to you by courtesy of 'SLUMP,' the Super soap. Come in, come in, wherever you are!" - - - "Jim!" Bowles' voice came back. "Come on out." "Later," Barnes answered. "Where's Doe?" "Right here," Corley answered. "I was just coming back." - "Good," said Barnes. "Red, I'll leave this switched on. Sing out now and then." "Sure thing," Bowles agreed. Barnes went to the desk and -began toting up mass reserves. An orbit computation is complicated; calculating what it takes to pull free of a planet is simple; he had a rough answer in a few minutes. - - · He ran his hand through his hair. He still needed that haircut—and no barbers on this block. He wondered if it were true that a man's hair continued to grow after his death. . - The hatch creaked and Corley climbed into the room. "Whew!" be said. "It's good to get out of that suit. That sun is really hot." - "Wasn't the gas expansion enough to keep you cool?" "Not cool enough. Those suits are hard to get around - -- in, too, Jim—they need a lot of engineering." "They'll get it," Barnes answered absently, "but reengineering this ship is more urgent. Not the Corley engine, Doe; the controls. They aren't delicate enough;" "I know," Corley admitted. "That poor cutoff—we'll have to design a prediction for it into the autopilot, and use a feedback loop." Barnes nodded. "Yes, sure, after we get - back—and if we get back." He tossed his fingers at the scientist. "Hum that through." - Corley glanced at it. "I know." "Red won't find a spot in line-of-sight with home; those mountains are infernally high. But I wanted him out of the way—and Mannie. No use talking to Red, he's going to get a posthumous Congressional Medal if it kills him—and us too." Corley nodded. "But I'm with him On trying to contact Earth; I need it worse than he does." "Hastings?" - "Yes. Jim, if we had enough margin, we could blast off and correct after radio contact. We haven't; if we get off at all it will be close." "I know. I spent our ticket home, when I made that

extra blast." "What good would it have done to have crashed? Forget it; I need Hastings. We need the best orbit possible." "Fat chance!" "Maybe not. There's libration, you know." Barnes looked startled. "Man, am I stupid!" He went on eagerly, "What's the situation now? Is Earth swinging up, or down?" The Moon's spin is steady, but its orbit speed is not; it moves, fastest when it is closest to Earth. The amount is slight, but it causes the Moon to appear to wobble each · month as if the Man-in-the-Moon were shaking his head. This moves the Earth to-and-fro in the lunar sky some seven degrees. Corley answered, "It's rising—I think. As to whether it will rise enough—well, I'll have to compute -Earth's position and then take some star sights." "Let's get at it. Can I help?" Before Corley could reply Bowles' voice came over the speaker: "Hey! Jim!" Barnes keyed the wallcie-talkies. "Yes, Red?" "We're at the hills south of the ship. They might be high enough. I want to go behind them; there may be an easier place to climb." - - On the airless Moon, all radiorequires line-of-sight— yet Barnes hated to refuse a reasonable request. "Okay— but don't take any chances." "Aye aye, Skipper." ' Barnes turned to Corley. "We need the time anyhow." "Yes," Corley agreed. "You know, Jim, this isn't the way I imagined it. I don't mean the Moon itself—just wait until we get some pressurized buildings here and some decent pressure suits. But what I mean is what we find ourselves doing. I expected to cram. every minute with exploring and collecting specimens and gathering new data. Instead I'll beat my brains out simply trying to get us back." "Well, maybe you'll have time later—too much time." Corley grudged a smile. "Could be—" He sketched out the relative positions of Earth and Moon, consulted tables. Presently he- looked up. "We're in luck. Earth will rise - nearly two and a half degrees before she swings back." "Is that enough?" "We'll see. Dig out the sextant, Jim." Barnes got it and Corley took it to the eastern port. He measured the elevations of three stars above the tops of the mountains. These he plotted on a chart and drew a line for the apparent horizon. Then he plotted Earth's position relative to those stars. "Finicky business," he complained. "Better check me, Jim.', "I will. What do you get?" "Well —if I haven't dropped a decimal point, Earth will be up for a few hours anyway three days from now." Barnes grinned. "We'll get a ticker-tape parade yet, Doe." - "Maybe. Let's have another look at the ballistic situation first." - Batnes' face sobered. - - Corley worked for an hour, taking Barnes' approximation and turning it into something slightly better. At last he stopped. "I don't know," he fretted. "Maybe Hastings can trim it a little." - - "Doe," Barnes answered, "suppose we jettison everything we can? I hate to say it, but there's all that equipment you brought." "What do you think I've been doing with these weight schedules? Theoretically the ship is stripped." "Oh. And

it's still bad?" - "It's still bad." Bowles and Traub returned worn out and just short of sun stroke. The Admiral was unhappy; he had not been able to find any way to climb the hills: "I'll go back tomorrow," he said stoutly. "I mean after we've eaten and slept." "Forget it," advised Barnes. "What do you mean?" "We are going to have line-of-sight from here." "Eh? Repeat that." "Libration," Barnes told him. "Doe has already calculated it." Bowles' face showed delighted comprehension. Traub looked puzzled; Barnes explained it. - - "So you see," Barnes went on, 4'we'll have a chance to send a message in about seventy hours." Bowles stood up, his fatigue forgotten. "That's all we · - need!" He pounded his palm exultantly. "Slow down, Red," Barnes advised, "our chances of taking off look worse than ever." "So?" Bowles shrugged. "It's not important." "Oh, for Pete's sake! Drop the Nathan Hale act. Have the common' decency to give a thought to Mannie and his four kids.",, Bowles started to retort, stopped—then went on again' with dignity. "Jim, I didn't mean to annoy you. But I meant what I said. It's not important to get back, as long as our message gets through. Our mistakes will make it easier for the next expedition.- In a year the United States can have a dozen ships, better ships, on the Moon. Then no country would be-so foolhardy as to attack us. That is important; we aren't." He went on, "Every man dies; the group goes on. You spoke of Mannie's kids. You have no children, nor has - Corley. Mannie has—so I know he understands what I mean better than you do." -He turned to Traub. "Well, - Mannie?" Traub looked up, then dropped his eyes. "Red is right, Mr. Barnes," he answered in a low voice, "but I'd like to -get home." Barnes bit his lip. "Let's drop it," he said irritably. "Red, you might rustle up some supper." For three days, Earth time, they labored. Bowles and Barnes stripped the ship—cameras, empty oxygen bottles, their extra clothing, the many scientific instruments Corley had hoped to use—Wilson cloud chamber, Geiger counter, a 12" Schmidt camera and clock, still cameras, 'the autocamera, ultra- and infra-spectrographs, other instruments. Corley stayed at his desk, computing, checking, computing again—getting the problem in the best possible shape to turn -over 'to Hastings. Traub overhauled his radio and lined up his directional antenna to the exact orientation at which Earth would appear. The hour finally crept up to them. Traub, was in his couch at the radio controls while the rest crowded at the eastern port. What they needed to say had been made one message: A formal claim to the Moon, setting forth time and · place of landing, a long and technical message to Hastings, and finally code groups supplied by Bowles. Traub would send it all out as one, many times if necessary. "I see it!" It was Corley who claimed the distinction. Barnes stared at the spot. "Your imagination, Doe; a highlight on the peaks."

The sun was behind them, “afternoon” by local time; the mountains were bright in the east. - Bowles put in, “No, Jim. There’s something there.” Barnes turned. “Start sending!” Traub closed his key. The message was repeated, with listening in between, time after time. An arc of Earth slowly, terribly slowly, crept above the horizon. No answer came back, but they did not despair, so little of Earth was as yet in sight. Finally Barnes turned to Corley. “What does that look like, Doe? The part we can see, I mean.” Corley peered at it. “Can’t say. Too much cloud.” “It looks like ocean. If so, we won’t get a jingle until it’s higher.” Corley’s face slowly became horror struck. “What’s the matter?” demanded-Barnes. “Good griefi I forgot to figure the attitude.” “Huh?” - Corley did not answer. He jumped to the desk, grabbed the Nautical Almanac, started scribbling, stopped, and drew a diagram of the positions of Earth, Sun, and Moon. On the circle representing the Earth he drew a line for the Greenwich meridian. Barnes leaned over him. “Why the panic?” “That is ocean, the Pacific Ocean.” Bowles joined’ them. “What about it?” “Don’t you see? Earth turns to the east; America is · - moving away—already out of sight.” Corley hurriedly consulted his earlier calculations. “Earth reaches maximum elevation in about, uh, four hours and eight minutes. Then it drops back.” Traub pushed up an earphone. “Can’t you guys shut up?” he protested. “I’m trying to listen.” Corley threw down his pencil. “It doesn’t matter, Mannie. You aren’t ever going to be in line-of-sight with NAA.” - “Huh? What did you say?” “The Earth is faced wrong. We’re seeing the Pacific Ocean now, then we’ll see Asia, Europe, and finally the Atlantic. By the time we should see the United States it will have dropped back of the mountains.” - “You mean I’m just wasting time?” “Keep sending, Mannie,” Barnes said quietly, “and keep listening. You may pick up -another station.” Bowles shook his head. “Not likely.” “Why not? Hawaii may still be in sight. The Pearl Harbor station is powerfuL” “Provided they have rigged a beam on us, same as NAA.” “Well, keep trying, Mannie.” Traub slipped his earphone back in place. Bowles went on, “It’s nothing to get excited about. We’ll be picked up anywhere.” He chuckled. “Soviet stations will be listening to us shortly. They will be broadcasting denials at the same time stations in Australia are telling the world the truth.” - Corley looked up. “But I won’t get to talk to Hastings!” Bowles said very gently: “As I said, that isn’t important in the long run.” Barnes said, “Stow it, Red. Don’t get downhearted, Doe—there is a good chance that some other station will beam us. Keep trying, Mannie.” “Will you guys please shut up?” He did keep trying over and over again; in the intervals he listened, not only to the beam frequency’ofNAA, but all over the dial. - More than eight hours later the last faint arc of Earth had vanished. No one had thought to eat and Traub had not left his

post for any purpose. - They went on preparing to leave, but their hearts were not in it. Corley stayed at his desk,' except for snatches of sleep, trying to make up by effort for the lack of fine tools. He set the departure ahead to, give him more time. The aching, cloudless lunar day wore on and the sun sank to the west. They planned to risk it just at sundown. It was admitted by Corley—and by Barnes, who checked his figures—that the situation theoretically did not permit success. By the book, they would rise, curve around the Moon, and approach the border where the fields of Earth and Moon balance—but they would never reach it; they would fall back and crash. It was also agreed, by everyone, that it was better to die trying than to wait for death. Bowles suggested that they wait a month until next sight of Earth, but arithmetic shut off that chance; they would not starve; they would not die of thirst—they would suffocate. Bowles took it serenely; Traub lay in his bunk or moved like a zombie. Corley was a gray-faced automaton, buried in figures. Barnes became increasingly imtable. - As a'sop to Corley, Bowles made desultory readings on the instruments Corley had not bad -time to use. Among the chores was developing the films taken on the flight across the back face. It had been agreed to keep them, they weighed ounces only, and it was desirable to develop them to prevent fogging by stray radioactivity. Barnes assigned Traub the task, to keep him busy. Traub worked in the airlock, it being the only darkroom. Presently he came poking his head up through the hatch. "Mr. Barnes?" "Yes, Mannie?" Barnes noted with satisfaction that Traub showed his first touch of animation since his ordeal. - "See what you make of this." Traub handed him a negative. Barnes spread it against a port. "See those little round things? What are they?" "Craters, I guess." "No, these are craters. See the difference?" Barnes tried to visualize what the negative would look like in positive. "What do you think?" "Well, they look like hemispheres. Odd formation, huh?" Barnes looked again. "Too damned odd," he said slowly. "Mannie, let's have a 'punt." "There's no print paper, is there?" "You're right; my error." Bowles joined them. "What's the curiosity? Moon maidens?" Barnes showed him. "What do you make of those things?" Bowles looked, and looked again. Finally he asked, "Mannie, how can we enlarge this?" It took an hour to jury-rig a magic lantern, using a pilfered camera lens. They all gathered in the airlock and Traub switched on his improvised projector. Bowles said, "Focus it, for cripes' sake." Traub did so. The images of his "hemispheres" were reasonably distinct. They were six in number, arranged in a semicircle —and they were unnatural in appearance. Barnes peered at them. "Red—you were a bit late when you claimed this planet."· Bowles said, "Hmmm—" Finally he emphatically added, "Constructions." "Wait a minute," protested Corley. "They look artificial, but some very

odd formations are natural." "Look closer, Doe," Barnes advised. "There is no reasonable doubt. The question: were we a year or so late in claiming the Moon? Or millions of years?" - "Eh?" "Those are pressure domes. Who built them? Moon people, long before history? Visiting Martians? Or Russians?" Traub said, "Mr. Barnes—why not live Moon peo ple?" - "What? Take a walk outside." "I don't see why not. As soon as I saw them I said, 'That's where those flying saucers came from a while back." "Mannie, there were no flying saucers. Don't kid yourself." - Traub said, doggedly, "I knew a man who—" - "—saw one with his own eyes," Barnes finished. "Forget it. That's our worry—there. They're real. They show on l~tlm." - "Forget Martians, too," Bowles said gruffly, "and any long-dead Moon people." "I take it you go for Russians?" Barnes commented. "I simply know that those films must be in the hands of military intelligence as soon as possible." "Military intelligence? Ah, yes, on Earth—a lovely thought." "Don~t he sarcastic. I mean it." "So do I." - - From willingness to die, his mission - accomplished, Bowles became frantic to live, -to get back. It made him bitter that he himself had insisted on landing—with all-important new evidence even then latent in the ship. He sweated out a possible scheme to get the films back to Washington and seized a time when Traub was out of the ship to propose it to Barnes. "Jim—could you get this ship back by yourself?" "What do you mean?" "You checked the figures. One man might make it—if the ship were lightened by the other three." -· Barnes looked angry. "Red, that's nonsense." "Ask the others." "No!" Barnes added, "Four men came; four go back— or nobody does." "Well, I can lighten ship, at least. That's my privilege." "Any more such talk and it'll be your privilege to be strapped down till takeoff!" Bowles took Barnes' arm. "Those films have got to - reach the Pentagon." "Quit breathing in my face. We'll make it if we can. Have you anything left to jettison?" "Jim, this ship gets back if I have to drag it." "Drag it, then. Answer my question." "I've got the clothes -I stand in—I'll jettison them." Bowles looked around. "Jettison, he says. Jim Barnes, you call this ship stripped. By~ God, I'll show you! Where's that tool kit?" "Traub just took it outside along with other stuff." Bowles jumped to the microphone. "Mannie? Bring back the hacksaw; I need it!" He turned to Barnes. "I'll show you how to strip ship. What's that radio doing there? Useless as a third leg. Why do I need an autopilot display? Yours is enough. Doe—get up off that stool!" Corley looked up from his closed world of figures. He had not even heard the row. "Eh? You called me?" '-'Up off that stool—I'm going to unbolt it from the deck." - Corley looked puzzled. "Certainly, if you need it." He turned to Barnes. "Jim, these are the final figures." Barnes was watching Bowles. "Hold the figures, Doe. We may make a few revisions." Under the drive of Bowles' will they stripped ship

again, fighting against their deadline. Rations—a/l rations— men do not starve quickly. Radios. Duplicate instruments. Engineering instruments not utterly essential to blasting. The hot plate. Cupboards and doors, light fixtures and insulation; everything that' could be hacksawed away or ripped out bodily. The ladder from control room to airlock—that was kicked outlast, with three space suits and the rope ladder. Bowles found no way to get rid of the fourth pressure suit; he had to wear it to stay alive while he pushed out the last items —but he found a way to minimize even that. He removed the instrument belt, the back pack, the air bottles, the insulating shoes, and stood there, gasping the air left in the suit, while the lock cycled from "vacuum" to "pressure" for the last time. Three hands reached down and pulled him through the hatch. "Stations!" Barnes snapped. "Stand by to blast!" - They were waiting for the count off, when Traub reached up and touched Barnes' arm. "Skipper?" "Yes, Mannie?" Traub looked to see if the other two were noticing; they were not. "Are we really going to make it?" Barnes decided to be truthful. "Probably not." He glanced at~ Bowles; the Admiral's features were sunken; his false -teeth had gone with the rest. Barnes grinned warmly. "But we're sure going to give it a try!" The monument where the proud Luna once stood is pictured in every schoolroom. Many trips followed, some tragic, some not, before space - transportation reached its present safe operation. The spaceways are paved with the bodies and glorious hopes of pioneers. With accomplishment of their dream some of the romance has gone out of space. Farqüharson, Ibid., Hi: 423 The End